from the TB epidemiology forms, hospital discharge records, and the patient writeups, all of which are maintained by the health departments for each TB patient. Twenty counties were selected in the eastern part of the state. Ten of the selected counties had higher than expected TB case rates (31) and ten had lower than expected case rates (32). Chi-square and difference of proportion tests were used to evaluate whether or not there was a significant difference between the two groups of counties in the measured variables.

Results from the survey that were statistically significant include the number of TB patients that were endogenous breakdowns and the number of TB patients that had concomitant illnesses. It was found that the low-incidence counties had a higher proportion of endogenous breakdowns, excluding the unknowns, and a higher proportion of TB patients with concomitant illnesses. However, the large percentage of unknowns in the endogenous breakdown variable (the high-incidence counties had 32% while the low-incidence counties had 16%) makes any statement about the differences in endogenous breakdowns very questionable. The data do not, however, support the idea that the higher TB rate in the ten counties is due to relatively higher endogenous breakdowns.

Other results from the survey include no statistically significant differences between the ten high-rate and ten low-rate counties in the proportion of TB patients that smoked, used alcohol, were exposed to asbestos or silica in the workplace, went to the health department for their illness, and were discovered by the health department. An interesting result from the survey was that most TB patients (90%) in the 20 counties sought health care on their own before the health departments found them. Since most people with TB usually are contagious before the severe symptoms set in, this finding is rather disturbing.

Zip Code Analysis

The purpose of the zip code analysis was to find out if the counties with high TB rates have high TB rates throughout the county or just in certain parts of the county. The ten N.C. counties with the highest TB case rates and case loads were chosen, and their TB cases were tabulated by their respective zip codes in that county. The zip code areas with a population of 1,000 or more in 1980 that had the highest TB rates are exhibited in Table 7. The rates for all of the zip code areas in the ten counties are shown in Appendix 1. If a zip code in one of the ten counties does not appear, then that zip code area had no TB cases reported.

It can be seen from Table 7 that there are zip codes with much higher TB case rates than their respective county rates. The range in zip code TB rates shown in Appendix 1 gives more evidence that there are certain "hot spots" in the high TB incidence counties. It can be argued, however, that this large range exists because some zip codes have very small populations and the TB rates are thus very unstable. But even when we eliminate the zip codes with less than a 1,000 population, the range in TB rates is large; therefore, further analysis was undertaken in order to account for these substantial geographic differences.

Correlation and multiple regression analyses were performed for the zip codes with 1,000 or more people in 1980. The logarithm of the TB rate for the zip codes was used because the relationship between the independent variables and the TB rate was again found to be nonlinear. Twenty zip code level variables were used in the analyses, and it was found that the variables that correlated most highly with the TB rate were the percentage of zip code residents 25 years and over with a high school education (-.48), the percentage of the zip code's work force in the farming-or-related sector (.43), the median rent in a zip code (-.43), and the percentage of nonwhites in a zip code (.36). Thus, the zip codes with high TB rates appear to be areas with a low education level, a high percent nonwhite, a low median rent, and a high percentage of the population engaged in farming. For multiple regression analysis, the independent variables with high standardized weights were the percentage of zip code residents 25 years and over with a high school education (-.66) and the percentage of the zip code's work force in the manufacturing or related sector (-.32). The R^2 was .31, the F value was 14.7, and the p value was less than 0.001.

It should be noted that some of the zip code TB rates are artifically inflated because migrant farmworkers are counted in the caseload but not in the population. Unfortunately, there is no easy way to subtract the migrants from the caseload or add them to the population. However, only Johnston and Sampson counties should have a substantial problem with this.

Standard Morbidity Ratios

The map in Figure 2 shows that the high eastern incidence of TB is not just a problem in North Carolina, but in Virginia and in South Carolina as well. In order to investigate this geographic pattern, standard morbidity ratios were calculated for each county in the three states. The standard morbidity ratio, or SMR, for a county is the actual number of TB patients in a county divided by the